

Prescription Pain and Other Medications

Prescription medications such as pain relievers, tranquilizers, stimulants, and sedatives are very useful treatment tools, but sometimes people do not take them as directed and may become addicted. Pain relievers make surgery possible, and enable many individuals with chronic pain to lead productive lives. Most people who take prescription medications use them responsibly. However, the inappropriate or nonmedical use of prescription medications is a serious public health concern. Nonmedical use of prescription medications like opioids, central nervous system (CNS) depressants, and stimulants can lead to addiction, characterized by compulsive drug seeking and use.

Patients, healthcare professionals, and pharmacists all have roles in preventing misuse and addiction to prescription medications. For example, when a doctor prescribes a pain relief medication, CNS depressant, or stimulant, the patient should follow the directions for use carefully, learn what effects the medication could have, and determine any potential interactions with other medications. The patient should read all information provided by the pharmacist. Physicians and other healthcare providers should screen for any type

of substance abuse during routine history-taking, with questions about which prescriptions and over-the-counter (OTC) medicines the patient is taking and why. Providers should note any rapid increases in the amount of a medication needed or frequent requests for refills before the quantity prescribed should have been used, as these may be indicators of abuse.

Commonly Abused Prescription Medications ———

While many prescription medications can be abused or misused, these three classes are most commonly abused:

- **Opioids**—often prescribed to treat pain.
- **CNS Depressants**—used to treat anxiety and sleep disorders.
- **Stimulants**—prescribed to treat narcolepsy and attention deficit/hyperactivity disorder.

Opioids

Opioids are commonly prescribed because of their effective analgesic, or pain relieving, properties. Studies have shown that properly managed medical

use of opioid analgesic compounds is safe and rarely causes addiction. Taken exactly as prescribed, opioids can be used to manage pain effectively.

Among the compounds that fall within this class—sometimes referred to as narcotics—are morphine, codeine, and related medications. Morphine is often used before or after surgery to alleviate severe pain. Codeine is used for milder pain. Other examples of opioids that can be prescribed to alleviate pain include oxycodone (OxyContin—an oral, controlled release form of the drug); propoxyphene (Darvon); hydrocodone (Vicodin); hydromorphone (Dilaudid); and meperidine (Demerol), which is used less often because of its side effects. In addition to their effective pain relieving properties, some of these medications can be used to relieve severe diarrhea (Lomotil, for example, which is diphenoxylate) or severe coughs (codeine).

Opioids act by attaching to specific proteins called opioid receptors, which are found in the brain, spinal cord, and gastrointestinal tract. When these compounds attach to certain opioid receptors in the brain and spinal cord, they can effectively change the way a person experiences pain.

In addition, opioid medications can affect regions of the brain that mediate what we perceive as pleasure, resulting in the initial euphoria that many opioids produce. They can also produce drowsi-

ness, cause constipation, and, depending upon the amount taken, depress breathing. Taking a large single dose could cause severe respiratory depression or death.

Opioids may interact with other medications and are only safe to use with other medications under a physician's supervision. Typically, they should not be used with substances such as alcohol, antihistamines, barbiturates, or benzodiazepines. Since these substances slow breathing, their combined effects could lead to life-threatening respiratory depression.

Long-term use also can lead to physical dependence—the body adapts to the presence of the substance and withdrawal symptoms occur if use is reduced abruptly. This can also include tolerance, which means that higher doses of a medication must be taken to obtain the same initial effects. Note that physical dependence is not the same as addiction—physical dependence can occur even with appropriate long-term use of opioid and other medications. Addiction, as noted earlier, is defined as compulsive, often uncontrollable drug use in spite of negative consequences.

Individuals taking prescribed opioid medications should not only be given these medications under appropriate medical supervision, but also should be medically supervised when stopping use in order to reduce or avoid withdrawal symptoms. Symptoms of withdrawal can include restlessness, muscle and bone

pain, insomnia, diarrhea, vomiting, cold flashes with goose bumps ("cold turkey"), and involuntary leg movements.

Individuals who become addicted to prescription medications can be treated. Options for effectively treating addiction to prescription opioids are drawn from research on treating heroin addiction. Some pharmacological examples of available treatments follow:

- Methadone, a synthetic opioid that blocks the effects of heroin and other opioids, eliminates withdrawal symptoms and relieves craving. It has been used for more than 30 years to successfully treat people addicted to opioids.
- Buprenorphine, another synthetic opioid, is a recent addition to the arsenal of medications for treating addiction to heroin and other opiates.
- Naltrexone is a long-acting opioid blocker often used with highly motivated individuals in treatment programs promoting complete abstinence. Naltrexone also is used to prevent relapse.
- Naloxone counteracts the effects of opioids and is used to treat overdoses.

Central Nervous System (CNS) Depressants

CNS depressants slow normal brain function. In higher doses, some CNS

depressants can become general anesthetics. Tranquilizers and sedatives are examples of CNS depressants.

CNS depressants can be divided into two groups, based on their chemistry and pharmacology:

- Barbiturates, such as mephobarbital (Mebaral) and pentobarbital sodium (Nembutal), which are used to treat anxiety, tension, and sleep disorders.
- Benzodiazepines, such as diazepam (Valium), chlordiazepoxide HCl (Librium), and alprazolam (Xanax), which can be prescribed to treat anxiety, acute stress reactions, and panic attacks. Benzodiazepines that have a more sedating effect, such as estazolam (ProSom), can be prescribed for short-term treatment of sleep disorders.

There are many CNS depressants, and most act on the brain similarly—they affect the neurotransmitter gamma-aminobutyric acid (GABA). Neurotransmitters are brain chemicals that facilitate communication between brain cells. GABA works by decreasing brain activity. Although different classes of CNS depressants work in unique ways, ultimately it is their ability to increase GABA activity that produces a drowsy or calming effect. Despite these beneficial effects for people suffering from anxiety or sleep disorders, barbiturates and benzodiazepines can be addictive and should be used only as prescribed.

CNS depressants should not be combined with any medication or substance that causes drowsiness, including prescription pain medicines, certain OTC cold and allergy medications, or alcohol. If combined, they can slow breathing, or slow both the heart and respiration, which can be fatal.

Discontinuing prolonged use of high doses of CNS depressants can lead to withdrawal. Because they work by slowing the brain's activity, a potential consequence of abuse is that when one stops taking a CNS depressant, the brain's activity can rebound to the point that seizures can occur. Someone thinking about ending their use of a CNS depressant, or who has stopped and is suffering withdrawal, should speak with a physician and seek medical treatment.

In addition to medical supervision, counseling in an in-patient or out-patient setting can help people who are overcoming addiction to CNS depressants. For example, cognitive-behavioral therapy has been used successfully to help individuals in treatment for abuse of benzodiazepines. This type of therapy focuses on modifying a patient's thinking, expectations, and behaviors while simultaneously increasing their skills for coping with various life stressors.

Often the abuse of CNS depressants occurs in conjunction with the abuse of another substance or drug, such as alcohol or cocaine. In these cases of

polydrug abuse, the treatment approach should address the multiple addictions.

Stimulants

Stimulants increase alertness, attention, and energy, which are accompanied by increases in blood pressure, heart rate, and respiration.

Historically, stimulants were used to treat asthma and other respiratory problems, obesity, neurological disorders, and a variety of other ailments. As their potential for abuse and addiction became apparent, the use of stimulants began to wane. Now, stimulants are prescribed for treating only a few health conditions, including narcolepsy, attention-deficit hyperactivity disorder (ADHD), and depression that has not responded to other treatments. Stimulants may also be used for short-term treatment of obesity and for patients with asthma.

Stimulants such as dextroamphetamine (Dexedrine) and methylphenidate (Ritalin) have chemical structures that are similar to key brain neurotransmitters called monoamines, which include norepinephrine and dopamine. Stimulants increase the levels of these chemicals in the brain and body. This, in turn, increases blood pressure and heart rate, constricts blood vessels, increases blood glucose, and opens up the pathways of the respiratory system. In addition, the increase in dopamine is associated with a sense of euphoria that can accompany the use of stimulants.

Research indicates that people with ADHD do not become addicted to stimulant medications, such as Ritalin, when taken in the form and dosage prescribed. However, when misused, stimulants can be addictive.

The consequences of stimulant abuse can be extremely dangerous. Taking high doses of a stimulant can result in an irregular heartbeat, dangerously high body temperatures, and/or the potential for cardiovascular failure or seizures. Taking high doses of some stimulants repeatedly over a short period of time can lead to hostility or feelings of paranoia in some individuals.

Stimulants should not be mixed with antidepressants or OTC cold medicines containing decongestants. Antidepressants may enhance the effects of a stimulant, and stimulants in combination with decongestants may cause blood pressure to become dangerously high or lead to irregular heart rhythms.

Treatment of addiction to prescription stimulants, such as methylphenidate and amphetamines, is based on behavioral therapies proven effective for treating cocaine or methamphetamine addiction. At this time, there are no proven medications for the treatment of stimulant addiction. Antidepressants, however, may be used to manage the symptoms of depression that can accompany early abstinence from stimulants.

Depending on the patient's situation, the first step in treating prescription stimulant addiction may be to slowly decrease the drug's dose and attempt to treat withdrawal symptoms. This process of detoxification could then be followed with one of many behavioral therapies.

Contingency management, for example, improves treatment outcomes by enabling patients to earn vouchers for drug-free urine tests; the vouchers can be exchanged for items that promote healthy living. Cognitive-behavioral therapies, which teach patients skills to recognize risky situations, avoid drug use, and cope more effectively with problems, are proving beneficial. Recovery support groups may also be effective in conjunction with a behavioral therapy.

Trends in Abuse of Prescription Drugs and Cough Medicine ———

Monitoring the Future (MTF) Survey*

OxyContin and Vicodin. In 2002, questions asking specifically about annual abuse of OxyContin and Vicodin were added for each grade covered by MTF. Annual abuse of Vicodin has remained stable at relatively high levels for each grade since its inclusion. The 2006 prevalence was 3.0 percent for 8th-graders, 7.0 percent for 10th-graders, and 9.7 percent for 12th-graders, and was the second most

prevalent illicit drug reported by 12th-graders in 2006. For OxyContin, annual abuse prevalence was 2.6 percent for 8th-graders, 3.8 percent for 10th-graders, and 4.3 percent for 12th-graders in 2006. This represents a drop for the first time since its inclusion among 12th-graders, from 5.5 percent in 2005. Although 8th and 10th grade rates did not change from 2005 to 2006, it nearly doubled among 8th-graders from 2002 to 2006.

Considering the addictive potential of oxycodone and hydrocodone, these are disturbingly high rates of use.

Tranquilizers. In 2003, the survey showed that lifetime, annual, and 30-day** abuse of tranquilizers had declined significantly from 2002 for 10th- and 12th-graders. This was the first year of decline for 12th-graders after a decade of gradual increase. In general, 8th-graders' rates of reported tranquilizer use have been considerably lower than those observed in the upper grades. These trends remained stable in 2006, with 6.6 percent of 12th-graders, 5.2 percent of 10th-graders, and 2.6 percent of 8th-graders reporting annual abuse of tranquilizers.

Sedatives. Only 12th-grade data are reported for use of sedatives. Lifetime use of sedatives among high school seniors remained statistically unchanged between 2005 (10.5 percent) and 2006 (10.2 percent).

Cough Medicine. In 2006, a question was asked for the first time about the

use of cough and cold medicines to get high. The purpose of this question was to determine the extent of use of Dextromethorphan, a cough suppressant found in many cough and cold preparations that also acts as a dissociative hallucinogen in high doses. Rates of use were relatively high, at 4.2 percent among 8th-graders, 5.3 percent among 10th-graders, and 6.9 percent among 12th-graders. Although trend data are not yet available, abuse of cough medicine was the fourth most prevalent illicit drug reported by 12th-graders in 2006, which is of concern especially considering the availability and accessibility of these drugs to youth.

National Survey on Drug Use and Health (NSDUH)***

According to the 2005 NSDUH, an estimated 6.4 million persons, or 2.6 percent of the population age 12 or older had used prescription psychotherapeutic medications nonmedically in the month prior to being surveyed. This includes 4.7 million using pain relievers, 1.8 million using tranquilizers, 1.1 million using stimulants, and 0.27 million using sedatives. Each of these estimates is similar to the corresponding estimate for 2004.

Past-month nonmedical use of prescription-type drugs among young adults aged 18 to 25 increased from 5.4 percent in 2002 to 6.3 percent in 2005. This was primarily due to an increase in pain reliever use, which was 4.1 percent in 2002 and 4.7 percent in 2003, 2004, and 2005.

Lifetime abuse of pain relievers declined among persons 12 to 17 and those aged 14 or 15 from 2004 to 2005, and past month OxyContin abuse was down for persons aged 16 or 17. There was a decline in lifetime and past year abuse of pain relievers among Whites between the ages of 12 and 17, but an increase in past year abuse among Blacks aged 26 or older.

Among persons aged 12 or older who used pain relievers nonmedically in the past 12 months, 59.8 percent reported that the source of the drug most recently used was a friend or relative, and that they received it for free. Another 16.8 percent reported that they obtained the drug from one doctor. Only 4.3 percent purchased the pain relievers from a drug dealer or other stranger, and only 0.8 percent reported buying the drug on the Internet.

Drug Abuse Warning Network (DAWN)****

For 2005, DAWN estimates that 598,542 emergency department (ED) visits involved nonmedical use of prescription or OTC pharmaceuticals or dietary supplements. Most of these visits (55 percent) involved multiple drugs and/or alcohol.

Central nervous system (CNS) medications (51 percent) and psychotherapeutic agents (46 percent) were reported most frequently in the nonmedical-use category of ED visits.

Among the CNS agents, the most frequently mentioned drugs were opiate/opioid analgesics (33 percent of non-medical-use visits), including single-ingredient (e.g., oxycodone) and combination forms (e.g., hydrocodone with acetaminophen). These three opioids appeared in similar numbers of visits:

- Hydrocodone/combinations in 51,225 ED visits
- Oxycodone/combinations in 42,810 ED visits
- Methadone in 41,216 ED visits

Among the psychotherapeutic agents, anti-anxiety agents, sedatives, and hypnotics were mentioned most frequently, occurring in one-third (34 percent) of visits associated with nonmedical use of pharmaceuticals. ED visits involving benzodiazepines (172,388) outnumbered those involving any of the other types of psychotherapeutic agents in 2005, which is comparable to the total for prescription opiates/opioids.

Community Epidemiology Work Group (CEWG)*****

In late 2005 and early 2006, fentanyl abuse emerged as a public health problem in seven CEWG areas (Chicago, Detroit, Philadelphia, St. Louis, New Jersey, Georgia, and Maryland). There were reports of confirmed or suspected deaths in these areas (including cases in which the drug was mixed with other substances.) Fentanyl is an opioid pain reliever that is similar to but 50 to 100

times more potent than morphine. Like morphine, fentanyl is administered by doctors to treat severe pain, but the type of fentanyl associated with recent overdoses was produced in clandestine laboratories and mixed with (or substituted for) heroin in a powder form.

For more information on addiction to prescription medications, visit <http://www.drugabuse.gov/drugpages/prescription.html>.

* These data are from the 2006 Monitoring the Future Survey, funded by the National Institute on Drug Abuse, National Institutes of Health, DHHS, and conducted annually by the University of Michigan's Institute for Social Research. The survey has tracked 12th-graders' illicit drug use and related attitudes since 1975; in 1991, 8th- and 10th-graders were added to the study. The latest data are online at www.drugabuse.gov.

** "Lifetime" refers to use at least once during a respondent's lifetime. "Past year" refers to use at least once during the year preceding an individual's response to the survey. "Past month" refers to use at least once during the 30 days preceding an individual's response to the survey.

*** NSDUH (formerly known as the National Household Survey on Drug Abuse) is an annual survey of Americans age 12 and older conducted by the Substance Abuse and Mental Health Services Administration. Copies of the latest survey are available at www.samhsa.gov and from the National Clearinghouse for Alcohol and Drug Information at 800-729-6686.

**** These data are from the annual Drug Abuse Warning Network, funded by the Substance Abuse and Mental Health Services Administration, DHHS. The survey provides information about emergency department visits that are induced by or related to the use of an illicit drug or the nonmedical use of a legal drug. The latest data are available at 800-729-6686 or online at www.samhsa.gov.

***** CEWG is a NIDA-sponsored network of researchers from 21 major U.S. metropolitan areas and selected foreign countries who meet semiannually to discuss the current epidemiology of drug abuse. CEWG's most recent reports are available at www.drugabuse.gov/about/organization/cewg/pubs.html.

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